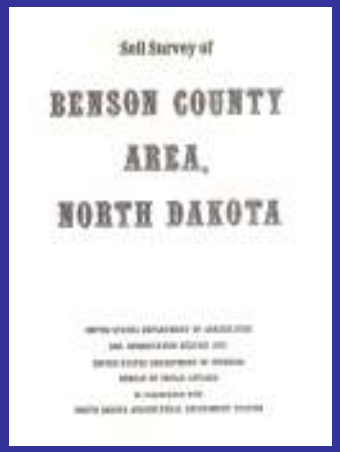
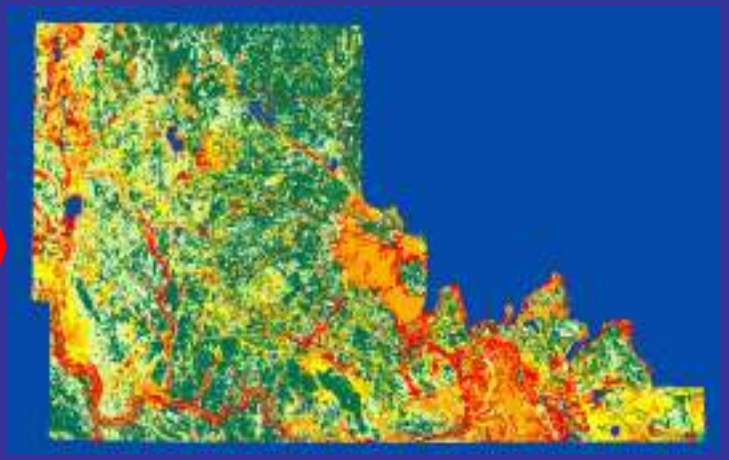
Soil Survey Geographic Database (SSURGO)



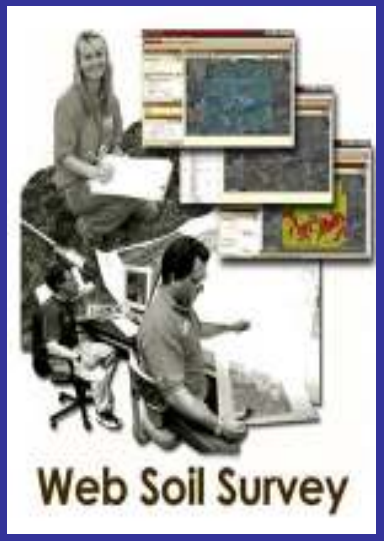


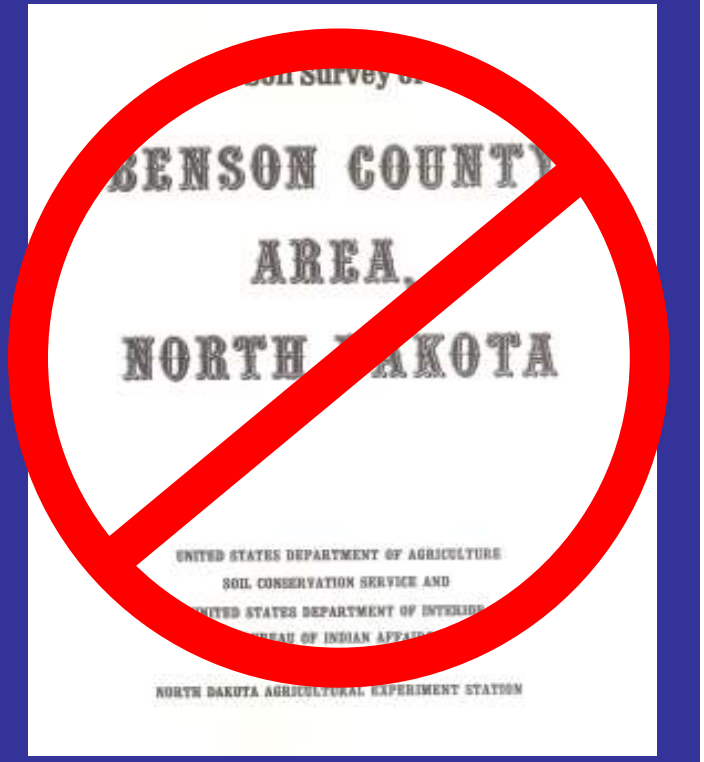
Creating Meaningful Data from Soil Survey Information

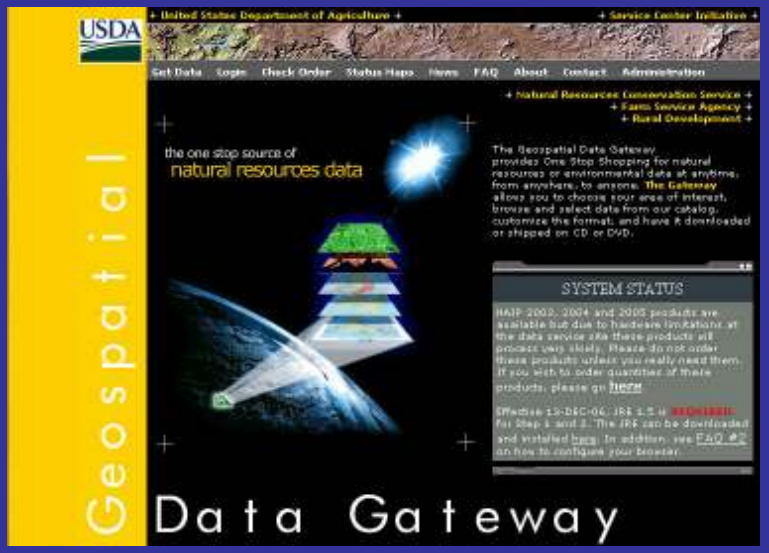
North Dakota GIS Users Conference 2007

So How Do I Go to get Soil Survey Information?

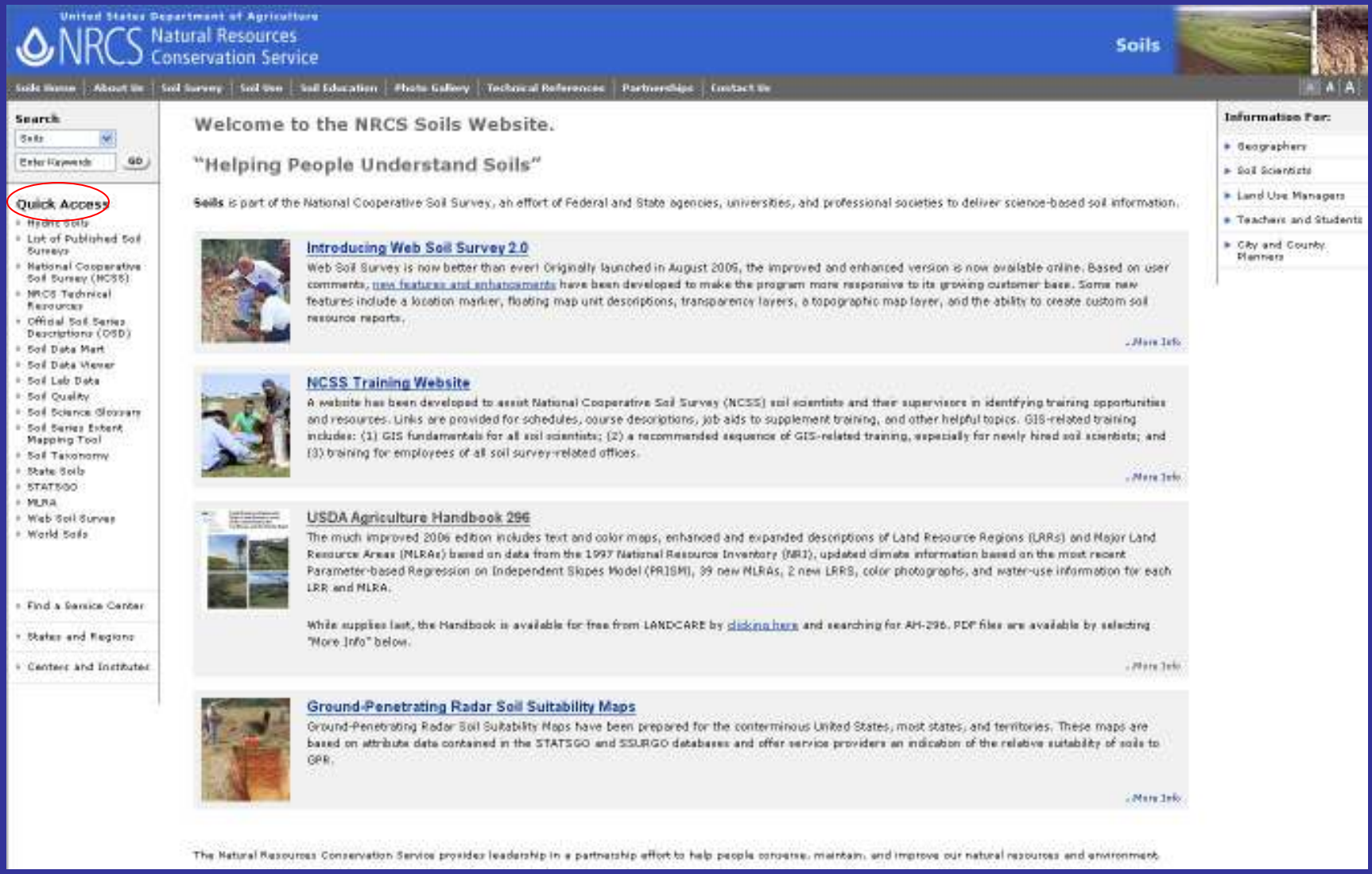
Soil Data Mart







http://www.soils.usda.gov/



One-Stop Shopping

Quick Access

- Hydric Soils
- List of Published Soil Surveys
- National Cooperative Soil Survey (NCSS)
- NRCS Technical Resources
- Official Soil Series Descriptions (OSD)
- ★ Soil Data Mart
- ★ Soil Data Viewer
- Soil Lab Data
- Soil Quality
- Soil Science Glossary
- Soil Series Extent Mapping Tool
- Soil Taxonomy
- State Soils
- STATSGO
- MLRA
- Web Soil Survey
- World Soils

Soil Data Mart

Official Source of SSURGO including Geospatial Datasets, Tabular Data & Reports

ArcGIS Tool to develop GIS-Ready Soil Interpretive Layers or create reports

Soil Data Mart

- Official Data Clearinghouse for SSURGO product
- Shapefile (Spatial) & Access Database (Tabular)
- Generate Interpretive Reports
- Subscribe to Soil Survey Area (Updates)

Soil Data Viewer

- Extension for ArcGIS 8.3-9.1 or standalone
- Compute a single value for a map unit and display results spatially
- Basic Mode - Interpretations Only (eg. Paths, Trails & Golf Fairways)
- Advanced Mode - Interpretations & Properties (Cation Exchange Capacity, Salinity)
- Output is a temporary shapefile
- Just click on the icon to launch

SDV Analysis in GIS

- SSURGO Download from Soil Data Mart
- Install Soil Data Viewer off of the web
- Add Soil Data Viewer Tools to Map Document
- Ensure Synchronization Status: All Mapunits in sync
- Generate Map
- Query for Desired Property
- Clip Query to Boundary

Documentation & Downloads Available: http://soildataviewer.nrcs.usda.gov/

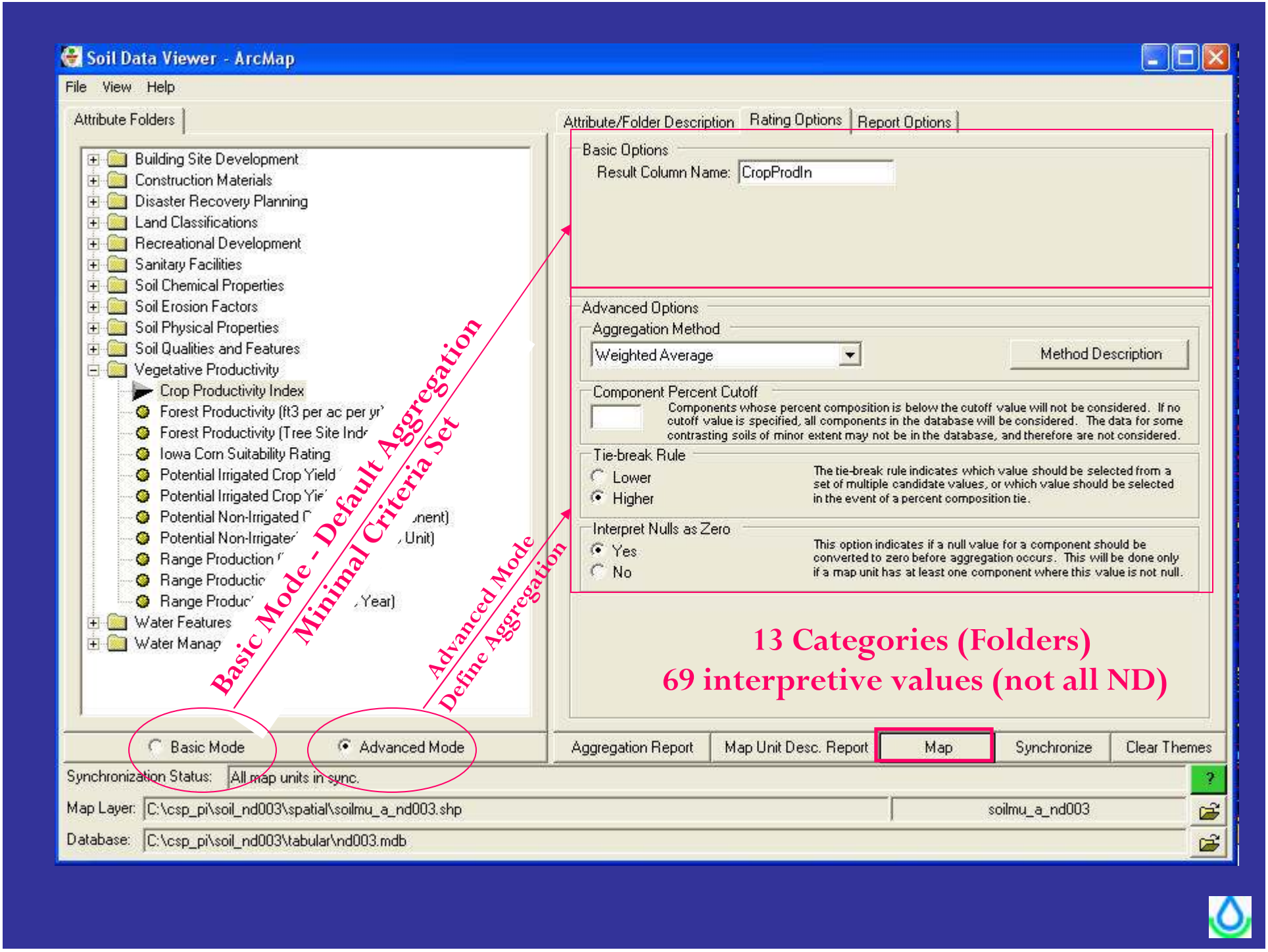
SDV News

- Release v5.2 for ArcGIS 9.2 expected November 2006
- Workarounds Available for 9.2 users
- Web Soil Survey Eventually May Have Functionality to Replace SDV

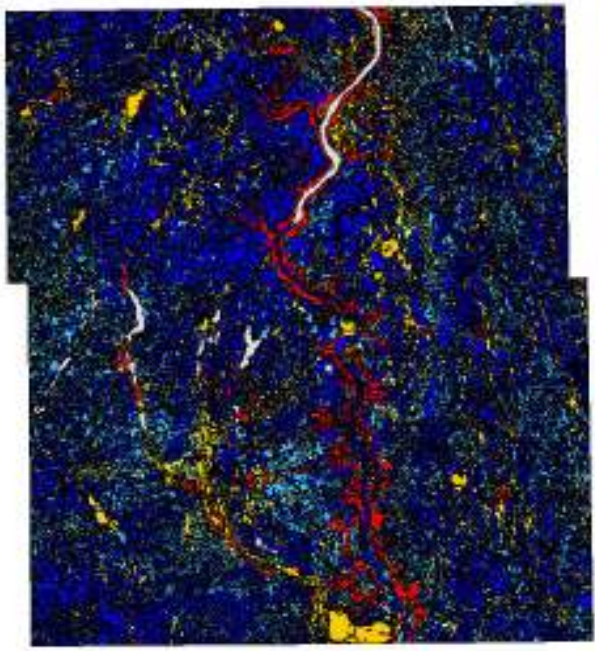
Documentation & Downloads Available: http://soildataviewer.nrcs.usda.gov/

When to use SDV instead of WSS?

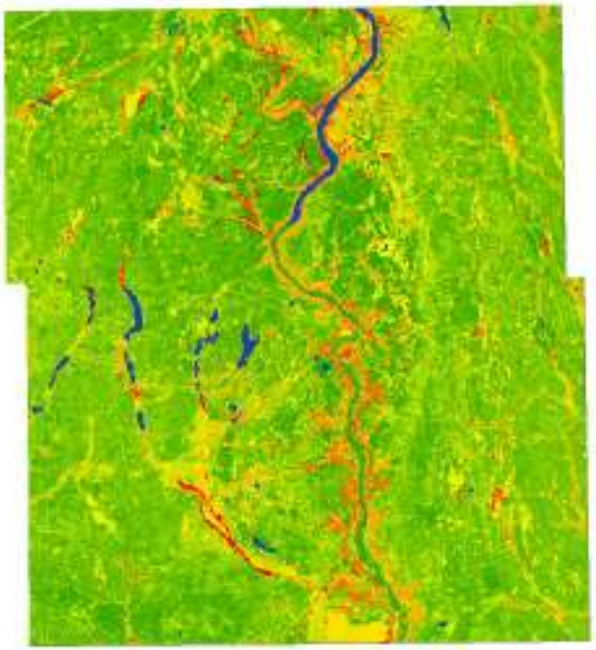
- Analysis over large areas (eg. watershed)
- Non-contiguous/irregular Area of Interest
- When classes are too broad in WSS
- GIS Overlay Analysis


Soil Data Viewer - ArcMap
File View Help
Attribute Folders
Building Site Development
Construction Materials
Disaster Recovery Planning
Land Classifications
Recreational Development
Sanitary Facilities
Soil Chemical Properties
Soil Erosion Factors
Soil Physical Properties
Soil Qualities and Features
Vegetative Productivity
Crop Productivity Index
Forest Productivity (ft3 per ac per yr
Forest Productivity (Tree Site Ind
Iowa Corn Suitability Rating
Potential Irrigated Crop Yield
Potential Irrigated Crop Yie
Potential Non-Irrigated C
nent)
Potential Non-Irrigate
Unit)
Range Production
Range Productio
Range Produc
Year)
Water Features
Water Manag
Basic Mode - Default Aggregation
Minimal Criteria Set
Advanced Mode
Define Aggregation
Attribute/Folder Description
Rating Options
Report Options
Basic Options
Result Column Name: CropProdIn
Advanced Options
Aggregation Method
Weighted Average
Method Description
Component Percent Cutoff
Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.
Tie-break Rule
Lower
Higher
The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.
Interpret Nulls as Zero
Yes
No
This option indicates if a null value for a component should be converted to zero before aggregation occurs. This will be done only if a map unit has at least one component where this value is not null.
13 Categories (Folders)
69 interpretive values (not all ND)
Basic Mode
Advanced Mode
Aggregation Report
Map Unit Desc. Report
Map
Synchronize
Clear Themes
Synchronization Status: All map units in sync.
Map Layer: C:\csp_pi\soil_nd003\spatial\soilmu_a_nd003.shp
soilmu_a_nd003
Database: C:\csp_pi\soil_nd003\tabular\nd003.mdb

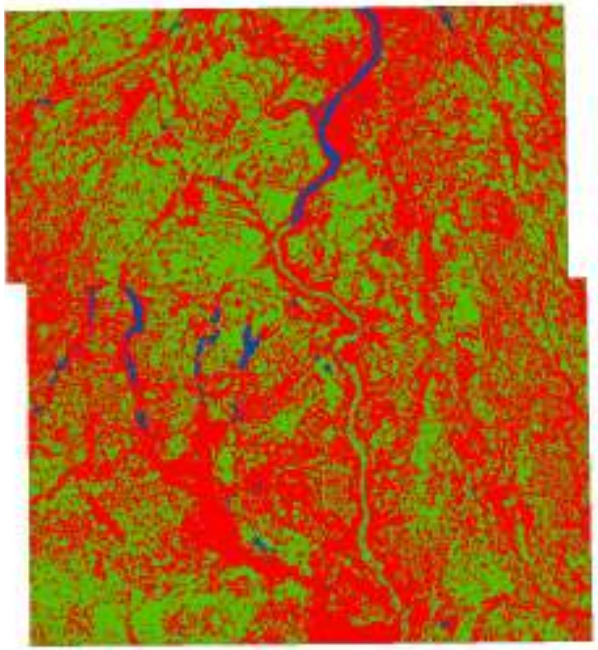
Customize Results to Meet Needs



Default SDV:
Natural Breaks

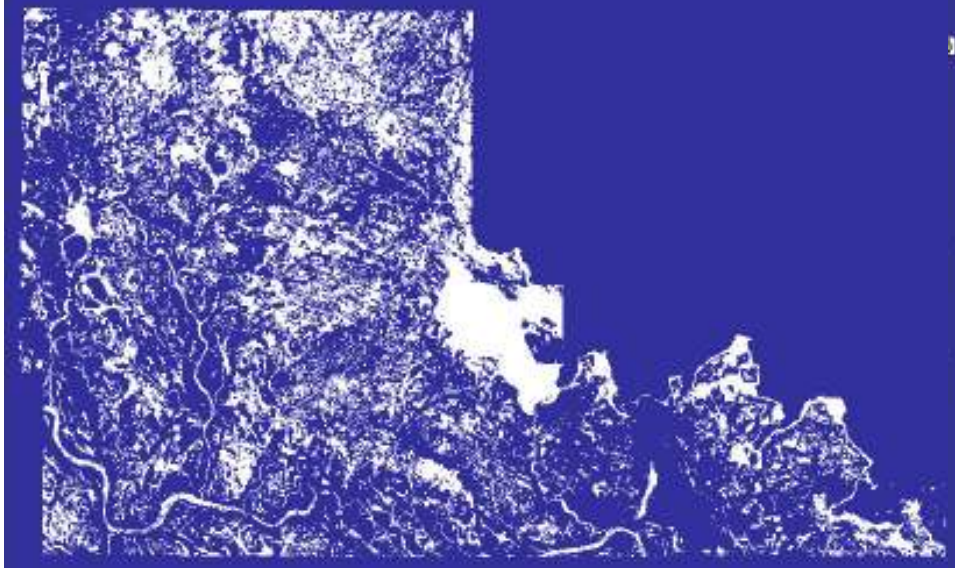


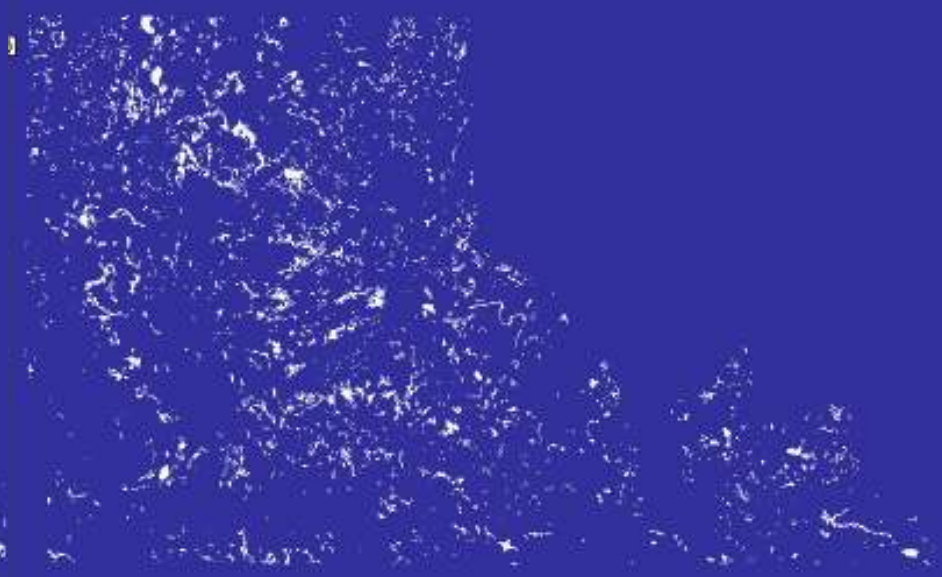
Custom:
Defined Interval



Custom:
Yes/No

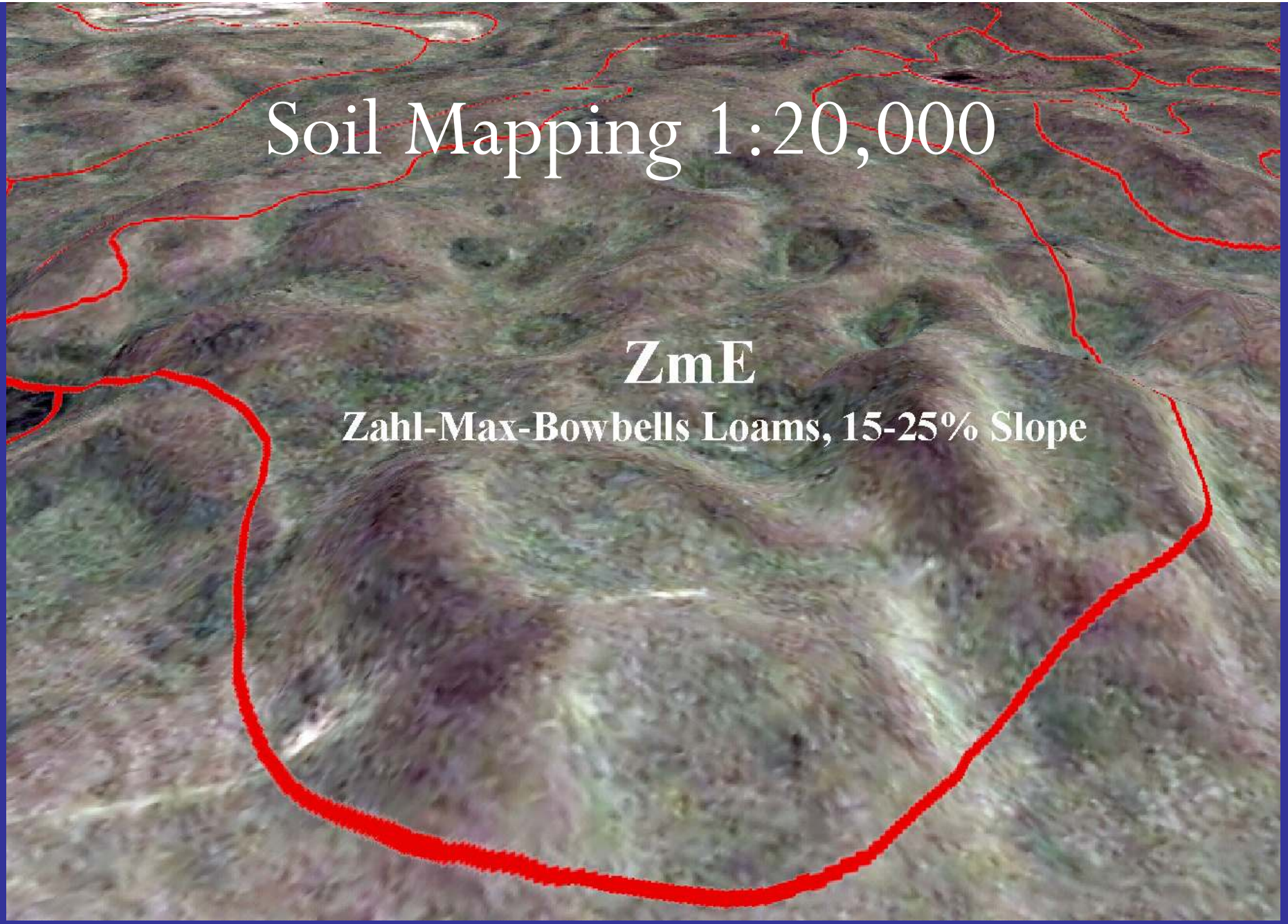
Interpreting Soil Interpretations



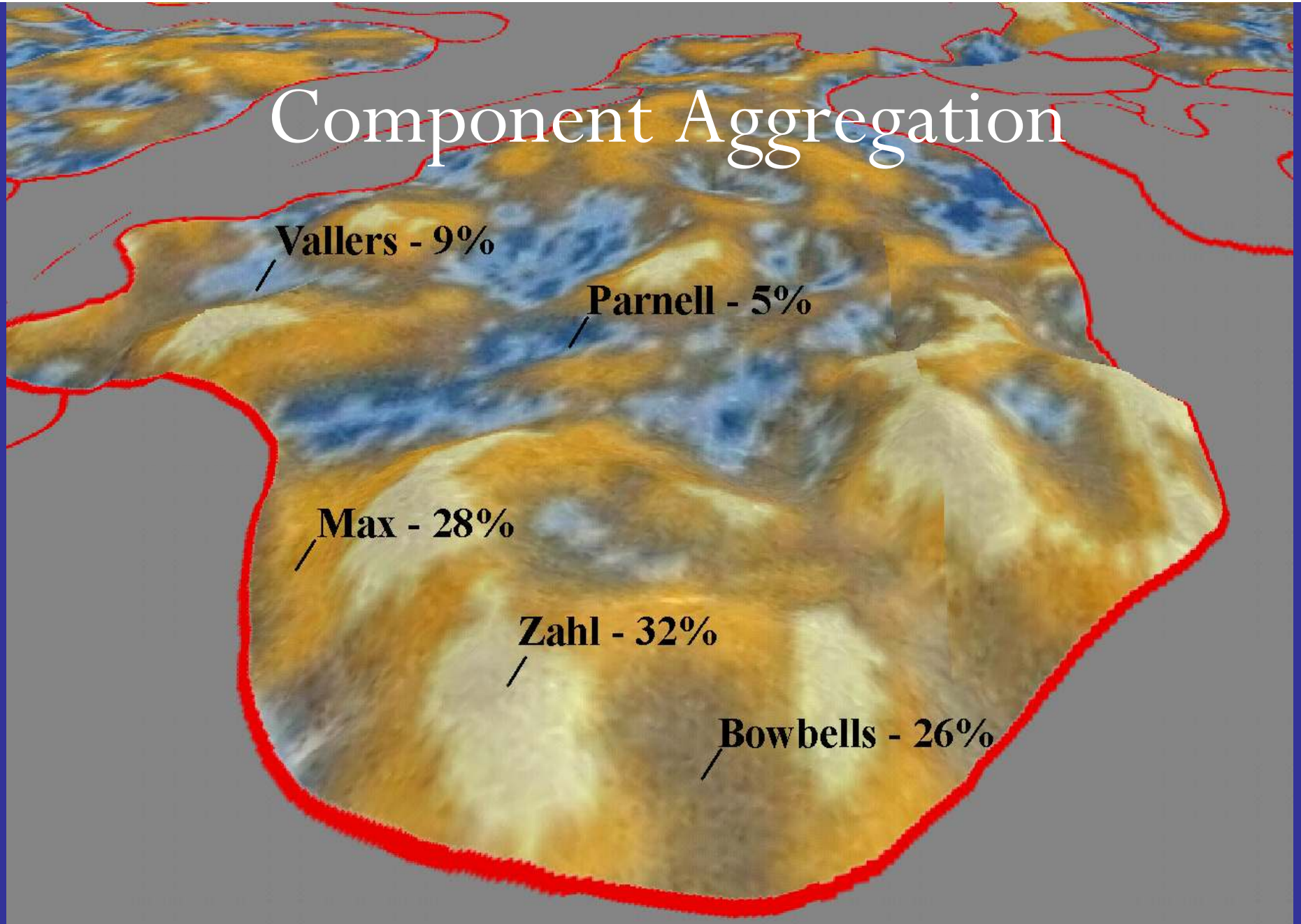


Linking Mapping Concepts to Ratings

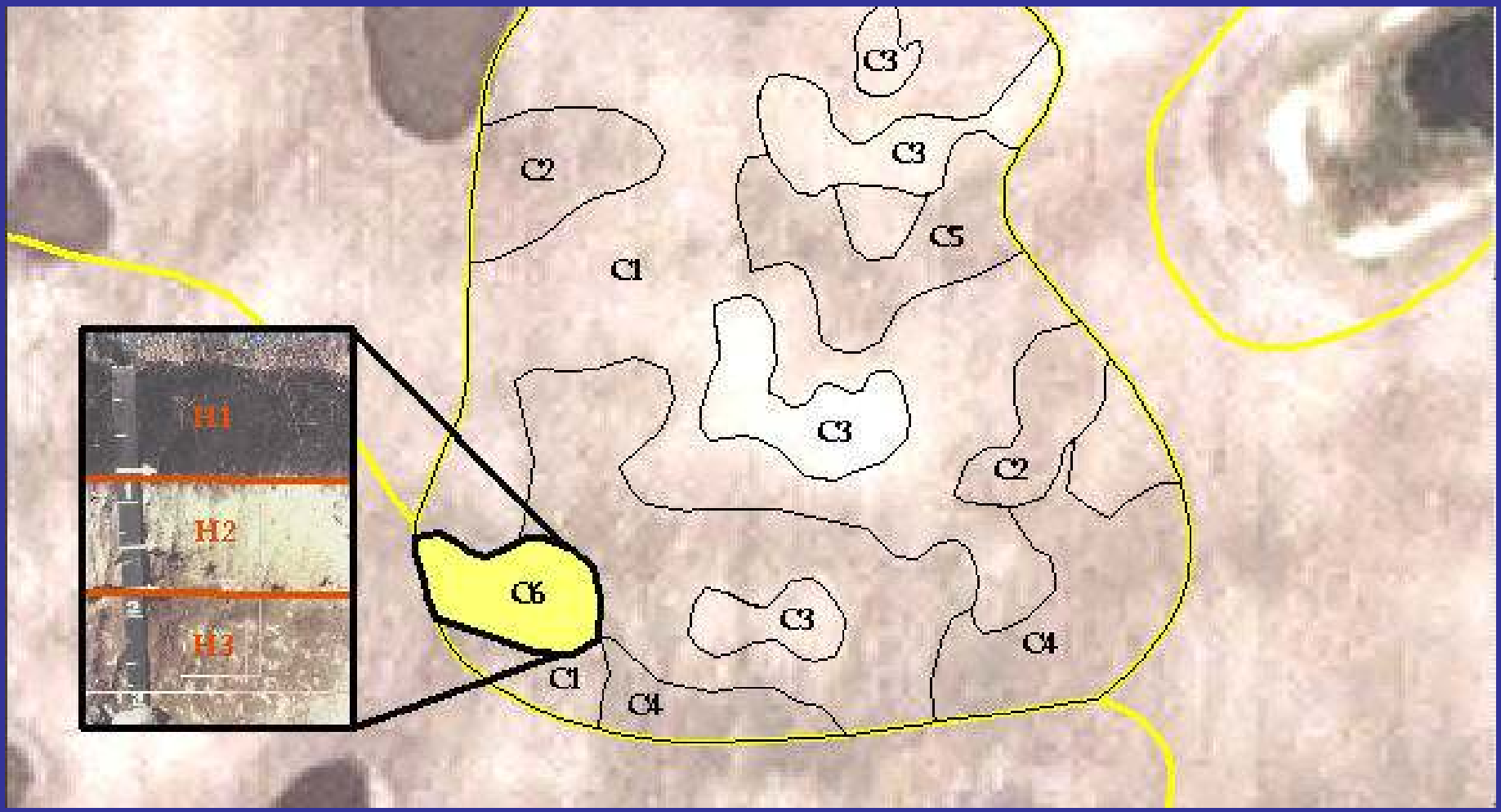
Soil Mapping 1:20,000



Component Aggregation



Horizon Aggregation



Component Aggregation

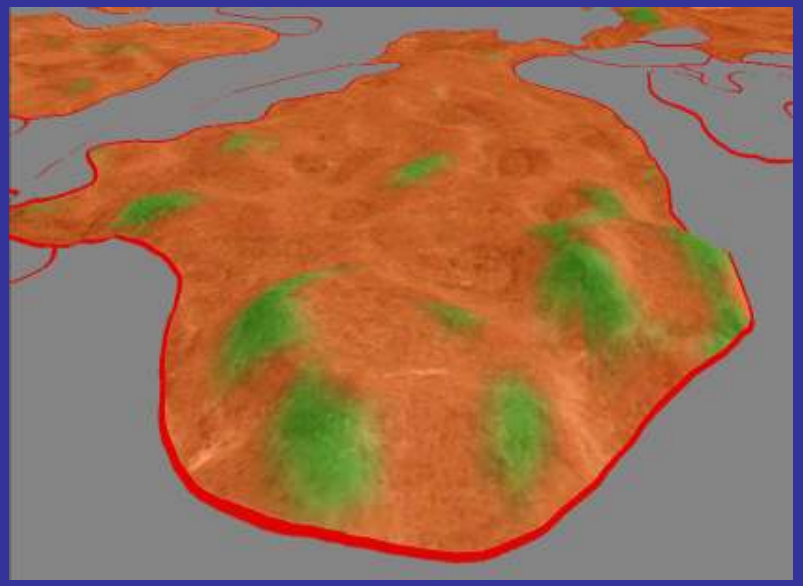
Selected Soil Property - Soil Erosion Factors: Kf

Component	Composition	Kf
Zahl	**32**	**.30**
Max	**28**	**.28**
Bowbells	**26**	**.24**
Hamerly	**9**	**.24**
Parnell	**5**	**.28**

Aggregation Method

Dominant Component

.30



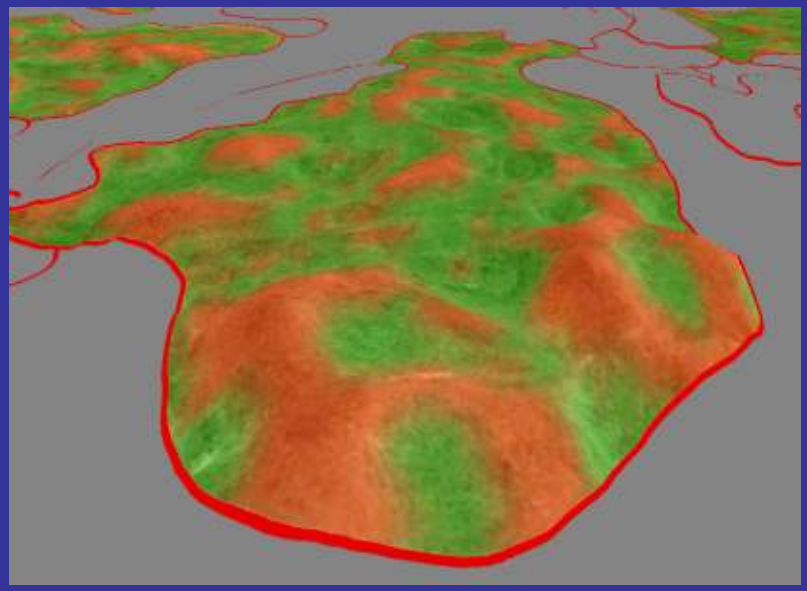
Component	Composition	Kf
Zahl	32	.30
Max	28	.28
Bowbells	26	.24
Vallers	9	.24
Parnell	5	.28

"Dominant Soil"

Aggregation Method

Dominant Condition

.24



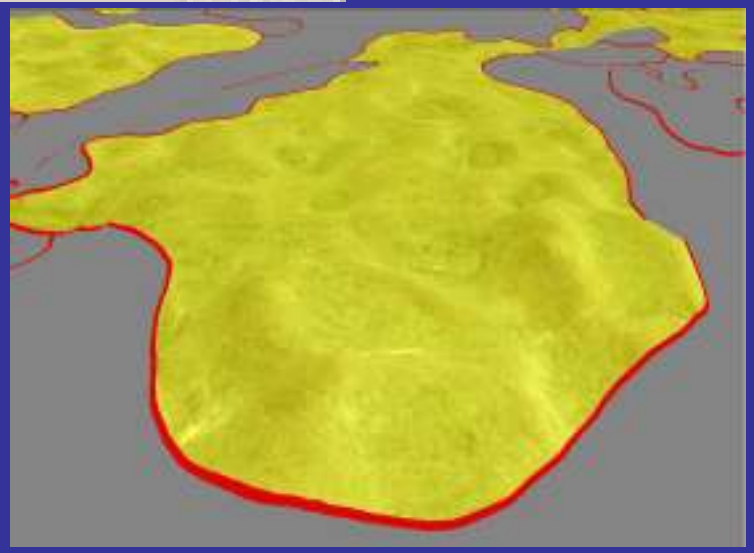
Component	Composition	Kf
Zahl	32	.30
Max	28	.28
Bowbells	26	.24
Vallers	9	.24
Parnell	5	.28

"Dominant Property"

Aggregation Method

Weighted Average

.27



Component	Composition	Kf	
Zahl	32	X .30	0.8
Max	28	X .28	1.3
Bowbells	26	X .24	1.2
Vallers	9	X .24	0.6
Parnell	5	X .28	+ 0.4

"Average Property Value"

Aggregation Method

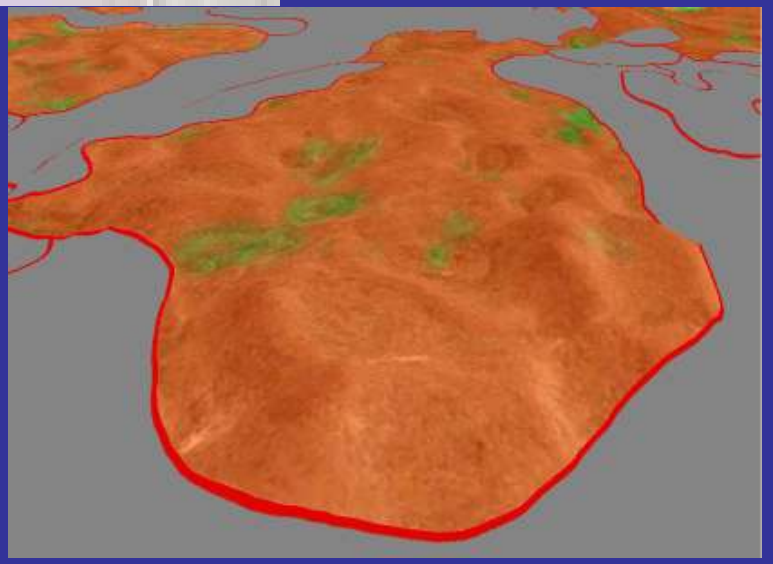
All Components

Tie-break Rule

Lower

Higher

.30



Component	Composition	Kf
Zahl	32	.30
Max	28	.28
Bowbells	26	.24
Vallers	9	.24
Parnell	5	.28

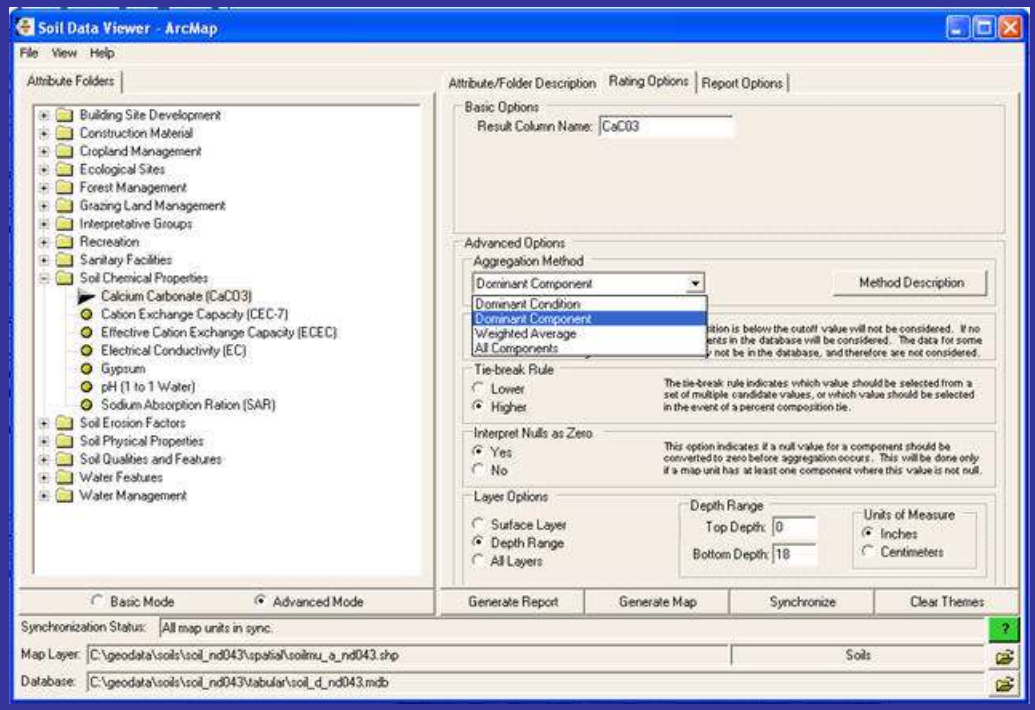
"Extreme Value"

Case Study: Drainage Class values in Stark County

A) What is the drainage of the first named soil?

B) What is the dominant drainage?

C) What are the drainage extremes?

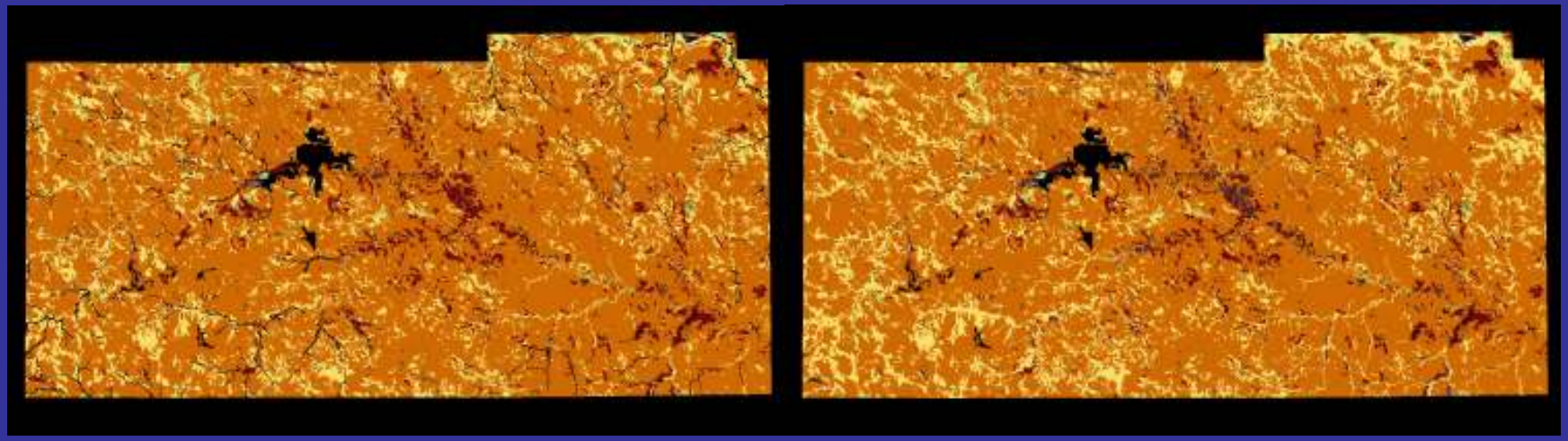


What is the drainage of the first named soil?

Aggregation Method?

What is the dominant drainage?

Aggregation Method?

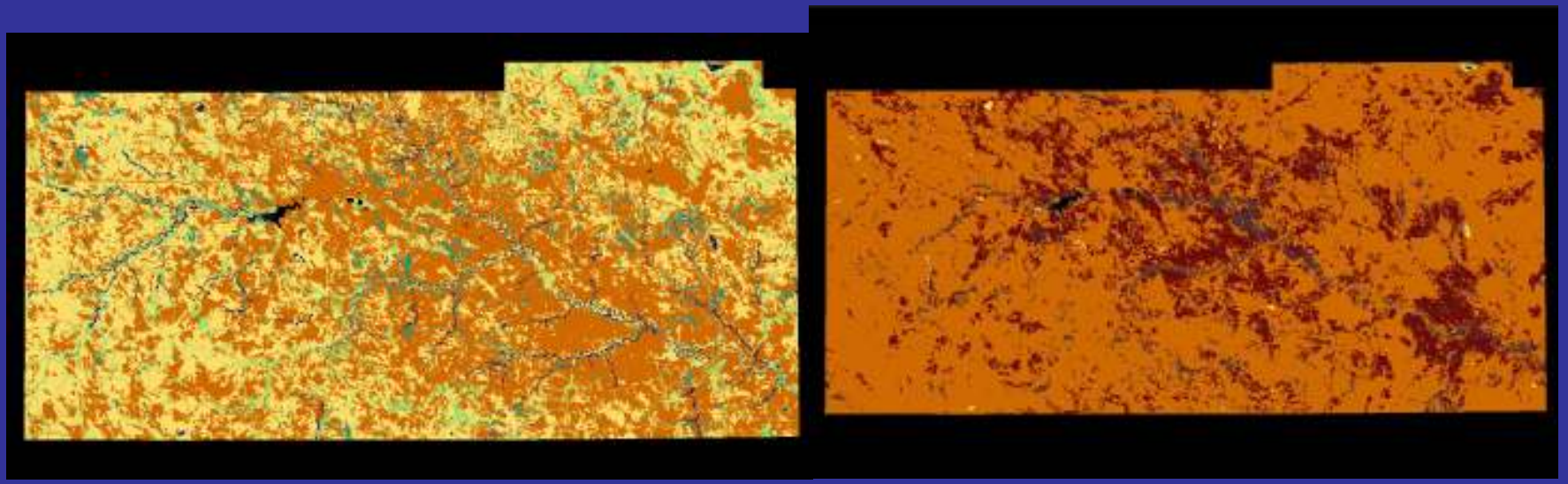


Dominant Component

Dominant Condition

What are the drainage extremes?

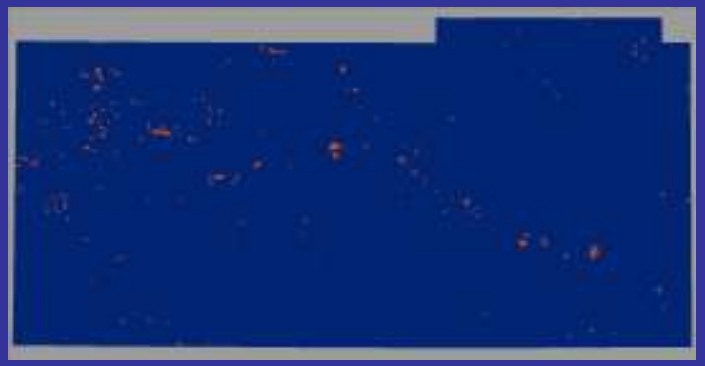
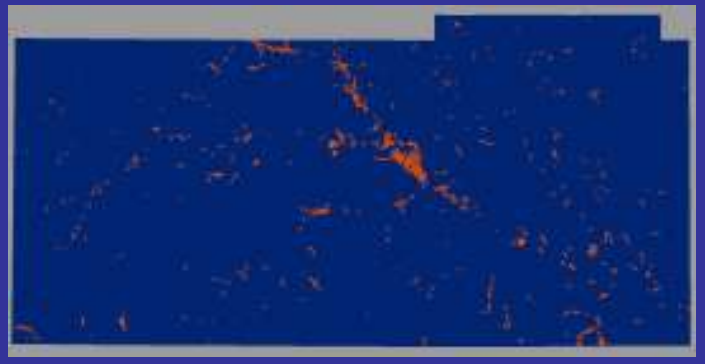
Aggregation Method?



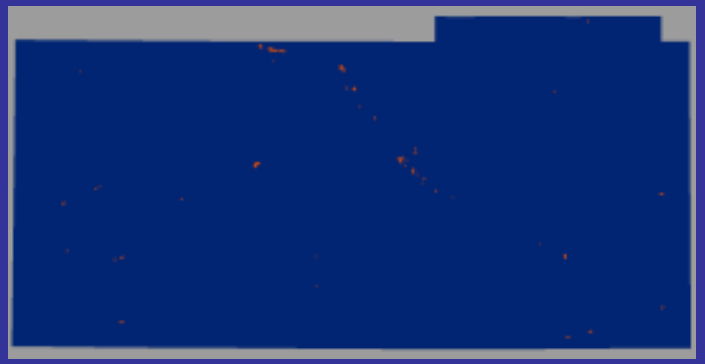
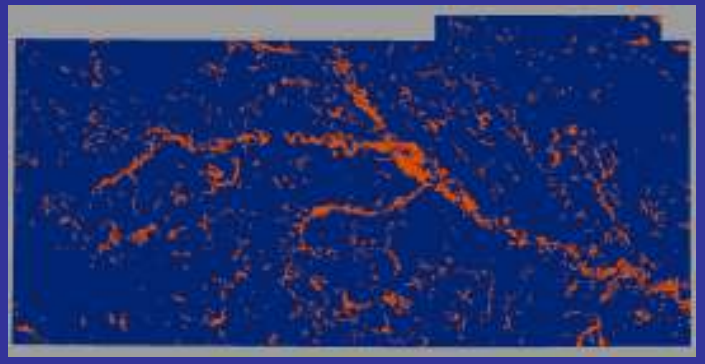
All Components (High)

All Components (Low)

Excessively Drained Results in SDV*

Aggregation	Acres	Polygons	County	
Dominant Component	3,000	220	0.3%	
Dominant Condition	10,200	458	1.2%	

Excessively Drained Results in SDV*

Aggregation	Acres	Polygons	County	
All Components (High)	600	44	0.0%	
All Components (Low)	45,500	2,372	5.2%	

Excessively Drained Soils – Best Estimate

Aggregation	Acres	Polygons	County	
Composition Summary	7,300	2,372	0.8%	

General Rules of Thumb

Default Method is A Good Place to Start

Qualitative Data – Dominant Condition

Quantitative Data – Weighted Average

Choose Aggregation Method to Suit Needs